

ABSTRACTS Selected from *Journal of Northeast Forestry University*(in Chinese)

The Bionomics of Willow Oyster Scale (*Lepidosaphes salicina*) Lin Tong(Northeast Forestry University, Harbin 150040, China), Yu Wen, Liu Kuanyu *et al*//J. Northeast For. Univ., -1997, 25(5),-71-73

During 1992-1993, in daqing city, Heilongjiang Province, field observations and periodic sampling of the willow oyster scale were practiced, in order to investigate the life history and the biological characteristics of different insect forms of *Lepidosaphes salicina*. Results indicated that the willow scale had one generation per year, overwintered in the form of eggs in the scale, begin to hatch in the last 10 days of May. From July to September was the adult stage. The second generation was the adult stage. The willow oyster scale attack trees mainly in the forms of nymphs and adult females.

Key words: Diaspididae, *Lepidosaphes salicina*, Bionomics

Control of Grub Using RH-5849 Granule Chi Defu, Miao Jiancai(Northeast Forestry University, Harbin 150040, P.R. China), Jiang Li, *et al*// J. Northeast For. Univ., -1997, 25(5),-25-28

RH-5849 is one kind of the insect growth regulator which has the effect as a molting pheromone for control of the larvae of Lepidoptera, Coleoptera and Diptera pests. It can restrain food-taking of those pests and hasten molting of the cuticula. This insecticide mainly has a stomach poisoning effect, with strong systemic effect and longer acting period. The residual duration of the RH-5849 granule is about 30 days. Twice or three times spraying should be conducted. First application of 3-5 g/m² RH-5849 granule was mainly used for control of the overwintering 2-3 instar larvae. One month later, 5 g/m² RH-5849 granulars can be spread on the surface of seedling's bed to control the first instar larvae of the new generation. The control effectiveness of these two times of spraying is between 90% to 94%. RH-5849 is one of the best new form and unharful pesticide which can be used in control of the grubs instead of those high-residual and high toxic pesticides.

Key words: RH-5849; Granule; Grub

Regulations of the Outbreak of *Quadrastidiotus gigas* Liu Junxia(Hebei Agriculture University, Baoding 071000, P.R. China) Liu Kuanyu, Yan Shanchun *et al*//J. Northeast For. Univ., -1997, 25(5),-5-9

Based on the investigation in field and data analysis, the regulations of the outbreak of *Quadrastidiotus gigas* was studied in Daqing City during 1993-94. The results indicated that the insect-resistance of *Populus xiaohai* and the hybrid of *Populus pseudomonii* × *Populus nigra* was higher than that of *Populus berolinensis*. The distribution of the poplar scales on the trunk (Accumulated insect density) was in the order of middle > upper > lower, and the number of poplar scale on the northeast direction of the trunk were more numerous than on the southwest direction. Survey's showed that the damage of the poplar tree began in the age of 3-4 years, and became most serious in the age of 7-9 years. The damage of the poplar scale was more serious on the border of the forest than in the forest, more serious in forest belts than in extended forests. Investigation of the relationship between the occurring area of the poplar scale and meteorological factors such as humidity, temperature in ten cities and

counties in Heilongjiang Province formulated a multiple linear regression model for the prediction of the occurring area of the poplar scale. Tests demonstrated that the use of this model for preliminary prediction gave reliable results.

Key words: *Quadrastidiotus gigas*, Regularities of occurrence, Prediction model

Model System of Growth Yield of Chinese Fir Plantation in Guizhou Ding Guijie(Research Group of Planting and Ecology, Guizhou Agriculture College, Guiyang 550025, P. R. China)//J. Northeast For. Univ., -1997, 25(5),-43-49

Based on site classification and evaluation, a series of models, including diameter and basal area growth under natural state, diameter distribution and diameter-height curve, mean height and mean DBH for thinning tree and post thinning stand, mean DBH growth of stand after thinning, and optimum density, were established using data from various experimental stands and permanent or temporary sample plots. The height of dominant tree as an independent variant is introduced into the concerned models since it is not much influenced by stand density and man activities. Those models mentioned above constituted the model system of growth yield of Chinese fir plantation in Guizhou. The model system can be used to deal with density control, prediction of stand structure and growth yield, analysis of thinning effectiveness, non-growth increment caused by thinning. It was proved through testing that this model system can be put into use in relevant study areas.

Key words: Chinese fir, Yield model system, System, Character, Coherent character

Sampling and Analyzing of Volatile Odorant of Plant Guo Xuefei, Yin Huiwei, Yan Shanchun *et al* (Northeast Forestry University, Harbin 150040, P. R. China)//J. Northeast For. Univ., -1997, 25(5), -105-108

This paper introduces an apparatus blowing adsorption and an experiment method for sampling and analyzing the volatile odorant of plant. Glass sample tube and air filter adopted in the experiment showed a good effect in sampling. This method avoids interference of background air and has no loss of odorant composition, which applies to many plant species on sampling odorant.

Key words: Plant odorant, Blowing adsorption, GC analysis

The Evolution of Korean Pine Forest Ma Jianlu(Heilongjiang Forest Research Institute, 150040, Harbin, China)//J. Northeast For. Univ., -1997, 25(5),-66-70

In Miocene epoch, about 25 million years ago, Korean pine emerged in east Asia. Korean-pine mixed forest stemmed from floras in Tertiary. Especially, the climate alternation between Glacial and Interglacial period in Quaternary and the temperature going up since Holocene seriously affected forming Korean-pine mixed forest. First mixed broad-leaved and conifer forest contained Korean pine came into during Miocene and Pliocene epoch. In the end of Epipleistocene, conifer forest dominated by spruce and fir, reflected periglacial climate, distributed throughout northeast China, when Korean pine was forced to migrate to Korean Peninsula to take refuge. After Pleistocene, Korean pine forest, at a rate of about 200 m one year, expanded towards Xiaoxing'an Mountains from its refuge in Glacial period. The horizontal distribution establishment of actual Korean-pine mixed forest was from Holocene, up to now about 2500 years.

Key Words: Korean-pine mixed forest, Glacial period, Ecological refuge, Holocene epoch, Distribution migration

Effects of Phytoecdysones from *Ajuga* Plants on the Nymph of Piercing-sucking Mouthparts Pests and Their Natural Enemies/Chi Defu, Shao Jingwen, Sun Fan(Northeast Forestry University, Harbin 150040, China) *et al*/J. Northeast For. Univ., -1997, (25).-87-90

Aphrophora intermandia Uhler, *Parthenolecanium corni* Bouche and *Myzus persicae* living on the hosts which were cultivated in the phytoecdysones solution extracted from *Ajuga multiflora*, *A. multiflora* var. *brevispicata*, *A. multiflora* var. *serotina* and *A. linearifolia* were significantly affected by those extracts. More than 90% of *Aphrophora intermandia* Uhler could be killed by those moulting pheromone substances. The living ability and emerging ability of the natural enemies of those pests such as *Leis ayridis* and some parasitoids were not affect by those extracts.

Key words: *Ajuga*, Phytoecdysone; *Ajuga multiflora*; *A. multiflora* var. *brevispicata*; *A. multiflora* var. *serotina*, *A. linearifolia*, *Aphrophora intermandia*, *Parthenolecanium corni*, *Myzus persicae*, *Leis ayridis*, Parasitoids

Effect of Phytoecdysones from *Ajuga* Plants on the Larvae of Lepidoptera Species Shao Jingwen, Chi Defu, Sun Fan *et al* (Northeast Forestry University, Harbin 150040, China) /J. Northeast For. Univ., -1997, 25(5).-87-90

Phytoecdysones have very significant effect on the growth, development and reproduction of some insects. *Ajuga* plants contain high quantity of those phytoecdysones. These experiments showed that those phytoecdysones extracted from *Ajuga multiflora*, *A. multiflora* var. *brevispicata*, *A. multiflora* var. *serotina* and *A. linearifolia* were very effective to kill larvae of *Aporia crataegi*, *Malacosoma neustria testacea* and *Lymantria dispar* L. Most of those extracts could lead 90% or more larvae of those pests to death.

Key words: *Ajuga*, Phytoecdysone, *Ajuga multiflora*, *A. multiflora* var. *brevispicata*, *A. multiflora* var. *serotina*, *A. linearifolia*, *Aporia crataegi*, *Malacosoma neustria testacea*, *Lymantria dispar*

Pathogen of Cone Rust on Spruce Xiao Yugui, Lin Qing (Sichuan Academy of Forestry, Chengdu 610081, China), Ma Xupeng /J. Northeast For. Univ., -1997, 25(5).-100-104

The *Thekopsora areolate* (Fr) Magn. is a macrocyclic rust fungi. Aeciospores and pycniospores of pathogen emerge from the scales of spruce cone. Urediniospores and teliospores parasitizes the hypodermic cell of *Prunus* spp. leaves. The pathogen overwinters with teliospores on diseased leaves of *Prunus* spp. and with aeciospores on diseased cone-scale of spruce. The aeciospores can germinate under temperature of 10-25°C and has the highest rate of germination under the condition of 10°C temperature and 100% humidity. Aeciospore stoped germinating when the humidity decrease to 80%. Germination of aeciospores is the best at 3% water agar membrane. Here the pathogen of cone rust of spruce in sichuan is diagnosed as *Thekopsora areolate* (Fr) Magn.

Key words: *Picea* spp., Cone rust disease, *Thekopsora areolate*

The Influence of Kairomone in *Quadrastriptotus gigas* and Oviposition Deterring Pheromone on Parasitoids on the Control Ability of Those Parasitoids Chi Defu, Zhang Fengbin, Hu Yinyue *et al* (Northeast Forestry University, Harbin 150040, P. R. China) /J. Northeast For. Univ., -1997, 25(5).-15-21

Kairomone that mainly existed in the scale of *Quadrastriptotus*

gigas are some water solvable compounds. The exist of those kairomone helps *Pteroptrix longiclava* and *Encarasis gigas* search and determine their host for oviposition so as to control the host population in a low level. The experimental results indicated that after oviposition of *Pteroptrix longiclava* and *Encarasis gigas* on their hosts some chemical compounds that have oviposition deterring effect were left on those parasited hosts. Those compounds have some deterring effects on host searching and determining activities of the two parasitoids. The exist of those compounds can significantly reduce the occurrence of superparasitism or multiparasitism, assure that the chalcids in the bodies of *Q. gigas* have sufficient nutrition, and let those chalcids use the limited eggs to control host as much as possible.

Key words: *Quadrastriptotus gigas*, *Pteroptrix longiclava*, *Encarasis gigas*, Pheromone, Kairomone, Oviposition deterring pheromone

Effect of Forest Harvesting and Afforestation on Physical Property of Soil Water Man Xiuling(Northeast Forestry University, Harbin 150040, P. R. China), Yu Fenghua, Dai Weiguang *et al* /J. Northeast For. Univ., -1997, 25(5).-57-60

The physical property of soil water was measured and studied by comparative experimental method in the main forest types in Xiaoxing'an Mountains after harvesting. The results showed that forest harvesting resulted in increase in soil volume weight, lessening porosity, and decline in function of water holding. Clear-cutting did more serious damage to soil, compared with selective cutting. The most serious damage to soil occurred on the skidding path. Planting suitable tree species after harvesting contributes to soil conservation.

Key words: Forest harvesting, Afforestation, Soil volume weight, Porosity, Storage capacity

Effects of Young Windbreaks of Pasture Lands on Microclimate of Spring Zhang Guozhen, Gong Weiguang (Northeast Forestry University, Harbin 150040, China), Liu Feng /J. Northeast For. Univ., -1997, 25(6).-71-73

To study the effects of young windbreaks on microclimate of spring on pasture lands of Taikang County, the air temperature, humidity, relative humidity, dew point, and the direction and speed of wind were measured by using Auto-multiple Climatic Factor Observation Meter in four types of windbreaks, wood-farm crops, wood-medicinal crops, wood-grass, and wood-fruit crops, and in the open field (check area), respectively. The results show that the efficiency of wind protection is 10.68%; the mean air temperature and the relative humidity are 0.44°C and 6.89% higher, respectively, and the evaporation 10.33% lower in the wind breaks than those in the open field, the soil temperature and max.-and min.-temperatures on ground surface are gentle, which made a favorable environment for grass growth.

Key words: Windbreaks, Pasture land, Microclimate, Ecological environment

Analysis of Climate Conditions for the Spring Big Forest Fire in Daxing'an Mountains of Inner Mongolia Fu Zheqiang (Meterological Bureau of Inner Mongolia, Huhchaote 010050, China), Chen Dong, Wang Yubin *et al* /J. Northeast For. Univ., -1997, 25(6).-16-19

The interrelations between the occurrence of big forest fire in spring and climate factors were studied by the ways of Principal Component Analysis and the Contrast Analysis. The main climate factors that affect the occurrence of big spring fire are spring rainfall and temperature of that year. Short of rain from

the previous year to March of coming year was the potential factor, which combined with high temperature in spring to impel the occurrence of big fire. Arid period carried within big fire in spring is from 6 to 15 months in the study area.

Key words: Daxing'an Mountains, Inner Mongolia, Big forest fire, Climate factors

Observational Experiments on Poplar Bacterial Canker Disease in Natural Condition /Gao Guoping, Guo Xihua(Liaoning Forestry Academy, Shenyang 110032, China)/J. Northeast For. Univ.,-1997, 25(6), -79-82

The disease of poplar bacterial canker in natural condition increased rapidly, and the incidence and index on disease raised significantly year by year. The speck of canker spreaded obviously on all sides year by year. The higher the class of disease was, the faster the speck spreaded. The spreading occurred from May to Augest each year, and the fastest spreading was in June. The inside and outside symptoms of trees in all disease classes changed obviously.

Key words: Poplars, Bacterial canker, Disease speck, Symptom

The Genetic Stability Analysis of Growth for New Cottonwood Clones /Li Huogen, Huang Minren, Pan Huixin *et al* (Nanjing Forestry University, Nanjing 210037, China)/J. Northeast For. Univ.,-1997, 25(6), -1-5

The genotype-environment interaction of 4-year DBH growth was analyzed in 4 locations for 5 cottonwood clones by using 5 genetic stability analysis methods. Each method was scientifically evaluated, and the genetic stability and the adaptation of each clone were also suitably appraised.

Key words: Cottonwood, Genetic stability, Adaption

Study on Depth of Root Decay in Basal Stem /Zhu Yujie (Northeast Forestry University, Harbin 150040, P. R. China), Zhou Jialin /J. Northeast For. Univ.,-1997, 25(6), -52-55

In 1990-1993, we traced and tested 571 decay tree-length in the sawmill located in forest areas of Zhangguangcui Mountains in Heilongjiang Province. By considering the shape of root decay in basal stem as a conicalness, we studied the relation between the decayed diameter of butt end of tree-length and the decayed depth in stem. The regression analysis was made to 498 points of 583 samples that covered 12 tree species. It is concluded that the forest areas of Zhangguangcui Mountains have root decay in stem of tree-length in mid-period and later period. There exists linear relation between the decayed diameter and decayed depth(H), and a formula by eucalyptus species was derived.

Key word: Root decay in stem, Correlation, Decay depth, Decay diameter

Forest Felling and Stability of Partial Forest Ecosystem /Dong Xibin, Zhu Yujie(Northeast Forestry University, Harbin 150040, P. R. China); Han Yuhua *et al*/ J. Northeast For. Univ.,-1997, 25(6), -30-33

The investigation on reforestation and soil and water conservation were made in the forest areas of Daxing'an Mountains, Xiaoxing'an Mountains and Changbai Mountains. Considering the analysis of great deal data, strip cutting or shelterwood felling was proposed to be used in the forest area of Daxing'an Mountains. When the cutting strip is set to 50-100 m in width and the remaining strip is 50-80 wide, the operation intensity must be controlled in 60%. In Xiaoxing'an Mountain and Changbai Mountain areas, for the stands dominated by spruce and fir, selection cutting less than 25% in intensity should be

used, and for broadleaf-Korean pine mixed forest, cutting intensity should be controlled in range of 24%-34%. The emphasis was made on that the cutting ways, felling intensity, skidding ways and the operation seasons should be scientifically chosen according to local conditions so as to reduce the destruction of stability of forest ecosystem to a minimum.

Key words: Forest felling, Forest ecosystem, Forest regeneration, Systematically stability

Biological Characters of *Laricifomes officinalis* /Gao Yuhai (Heilongjiang University Yichun School, Yichun 153000, China), Xu Huichun, Dengjian *et al*/J. Northeast For. Univ.,-1997, 25(6), -34-37

Study results on biological characters of *Laricifomes officinalis* show: the pathogen grows best on the juice of cooked *Larix* timber-PDA culture medium; its best growing temperature is 25 C; the best pH value is 3-4; the best carbon source is glucose; the best nitrogen source is Glycine. Under no illumination condition, *Laricifomes officinalis* grows better.

Key words: *Laricifomes officinalis*, Biological character, Culture medium

Effects of Senbao 1° on Growth and Development of Seedling and Its Physiological Mechanism /Yu Wenxi, Liu Guangju (Heilongjiang Forest Protection Research Institute, Harbin 150040, China), Zhang Jie *et al*/J. Northeast For. Univ.,-1997, 25(6), -11-15

The seedlings of Larch, Korean pine, Spruce, Scots pine and Manchurian ash were treated using Senbao 1°, a new kind of seedling protective chemicals. Senbao 1° could significantly increase the growth of nursery stock with dose of 0.075-0.250g/m². The larch seedlings treated with 0.250 g/m² Senbao 1° increased in diameter, length of main roots, number of lateral roots, stem, dry and fresh weights, and rate of dry weight to fresh weight by 31.76%, 26.35%, 38.94%, 18.4%, 15% and 8.9%, respectively, compared with the control. The preserve rate for bed-change stock and new planting-seeding of larch raised by 10%. The physiological effects of Senbao 1° were as follows: increased the concentration of chlorophyll, nitrogen, phosphorus, and potassium of leaves and reduced the contents of nitrogen, hormones(GA3, IAA and ABA) in leaves.

Key words: Senbao 1°, Nursery stock, Nutrient substance, Physiological mechanism

Planting Techniques of *Populus* Plantation in Southern Changbai Mountains /Ren Chunhua(Dept. of Biology of Tonghua Normal College, Tonghua 134002, China), Li Hong /J. Northeast For. Univ.,-1997, 25(6), -74-78

Key techniques for *Populus* planting in southern Changbai Mountains such as species selection, suitable site and tending have been systematic studied by collecting a great deal of data and contrast trials. Results show: (1) Different species of *Populus* needs different air temperature condition. Such native species as *Populus ussuriensis* and *Populus suaveolens* should be selected firstly in every microclimate region. (2) The most suitable site for *Populus* plantation is the flat, vally and bank of river, which have optimal water and fertilizer condition. (3) The increment of height and diameter can get significantly increased by grass removing, soil preparation and fertilization, 145.4%-275.7% for height increasing and 151.3%-272.0% for diameter. It provides an important base for cultivating the resource of *Populus* plantation in this district.

Key words: *Populus* spp., Plantation, Site, Tending

Consanguineous Relationship of Three Species of Sect. *Cembre* Spach of *Pinus* from Daxing'an Mountians in China--A Comparative Study on the POD Isonzyme Zymogram/Chen Fengying, Zeng Kewen, Xiao Xianghong, et al(Northeast Forestry University, Harbin 150040, China)//J. Northeast For. Univ., -1997, 25(6) .-48-51

By means of polyacrylamide gel electrophoresis, peroxidase isoenzymes of three species of *Sect. cembre* spach of *Pinus* were analyzed. The results showed that interspecific zymogrammatic variation can be observed within three species of *Sect. cembre* spach of *Pinus*. The zymogram of *Pinus pumila* and *P. sibirica* possesses their specific characteristics and their zymogram distance is 0.600. The variation of POD isoenzyme zymogram exists in ten samples of *Pinus pumila* and their zymogram distance is 0.288. Though the zymogram are differences between *P. hinggramensis* H. T. Zhang and *Pinus pumila*, zymogram are very resemble. This fact indicates that the interspecific consanguineous relationship are very close.

Key words: *Pinus pumila*; *Pinus sibirica*; Peroxidase isoenzymes; Isonzyme zymogram; Consanguinity

Growth Rythem of *Picea koraiensis* Plantation/Ni Naihua (Northeast Forest University, Harbin 150040, China), Li Guoxin, Zhao Shuli et al//J. Northeast For. Univ., -1997, 25(6) .-63-65

For *Picea koraiensis* plantation, the bud begin to expand when the temperature is above 0 °C. Height growth begins when temperature is higher than or equal to 5 °C. The annual height growth is 44.96 cm. Fast growing period is in the middle of June, and the average height growth of the day is 1.78 cm. *Picea koraiensis* belong to short growth period species, and its growth period is 61 days. There are close relationship among height growth, temperature accumulation and radiation.

Key words: *Picea koraiensis*, Population growth rythem, Short growth type

Ecological Characteristics and Management of Wildlife in Desert of China/Wang Xuhui, Wang Wen Gao, Zhongxin (Northeast Forestry University, Harbin 150040, China)//J. Northeast For. Univ., -1997, 25(6).-26-29

Special animal community had been formed on condition of desert ecosystem. The number of species and the biomass per unit area in desert ecosystem is lower than other ecosystem. The rodent and antelopes are dominant in desert ecosystem. The animal in desert can adapt to the arid climate, because they have the special body, physical and behavior feature in the course of evolution. Desert ecosystem is very weak, its resilience and resistance are feeble under the outer disturbance, for this reason, first, we should protect the environment of desert ecosystem; then we also should produce better habitat for wildlife. The habitat for wildlife include food, water and hiding place, food resource includes quality, quantity and availability. And habitat improvement includes providing better hiding place, food and water with high quality. Wildlife management includes management of rare animals, economic animals and normal animals. the management of these animals have the common and special character. PVA (Population Viability Analysis) and Grey system theory have been wildly used in the management of wildlife nowdays.

Key words: Desert, Wildlife, Management strategy.

The Mammals Fauna of Hulunbeier Grassland/Wang Wen, Wang Xuhui, Gao Zhongxin(Northeast Forestry University,

Harbin 150040, China)//J. Northeast For. Univ., -1997, 25(6) .-20-25

52 species of mammals have been recorded in Hulunbeier grassland. They belong to 6 orders and 17 families. Among them, the more abundant mammals are Rodentia, Chiroptera, Carnivora. In the mammalian fauna, the Palaearctic species are dominant, and the Oriental species are less, with 6:1 ratio in number. The economic actives of human beings have led to a decrease in the population of the fauna in the area. The mammal resources, natural protection as well as rodent damage and population growth were discussed.

Key words: Grassland, Mammal, Fauna

To Reinforce the Strength of Particleboard with Fiberglass/Pu Anbin, Zhang Xiangquan, Tan Haiyan, et al(Northeast Forestry University, Harbin 150040, China)//J. Northeast For. Univ., -1997, 25(6) .-38-42

The woven glass fabric was selected as reinforcement for particleboard to improve board's modulus of rupture(MOR) and modulus of elasticity(MOE). When the weight per unit area of woven glass fabric ranged from 100 to 370g/m², the reinforced particleboard had an upward trend in MOR and MOE, while a downward trend in internal bond strength. MOR was improved greater than MOE. The reinforced particleboard had upward trend in MOR and MOE when the adhesive consumption of impregnating fiberglass cloth ranged from 0 to 75 g/m².

Key word: Fiberglass, Particleboard, Strength

Design of RBT14-Cone Collecting Machine/Kong Qinghua, Lu Huaimin, Wang Shouzhong(Northeast Forestry University, Harbin, 150040 P. R. China)//J. Northeast For. Univ., -1997, 25(6) .-60-62

In order to improve collecting efficiency and security and to reduce damage to the trees, RBT14-cone collecting machine was developed. This machine is composed of three parts, manipulator by five freedoms and full hydraulic driving, J-50 crawler tractor and the variable sequence numerical control system by computer on slice. This machine is designed reasonably, easy to operating and has reliable quality. The maximum height of collecting is 14 m. The maximum radius of operating is 6.8 m. The average production of a day is about 500 kg.

Key words: Cone collecting, Hydraulic drive, Sequence control, Manipulator

Furniture and Environment/Li Jian(Northeast Forestry University, Harbin 150040, P. R. China), Wang Songyong (Taiwan University)//J. Northeast For. Univ., -1997, 25(6).-43 ~ 47

This paper related the current state of development of furniture industry in Taiwan, analyzed the major factors that may advance the development of furniture industry, and prospect the development direction in future. Furniture and wooden materials are important part for composing the space of living, learning and working of human being. Wood has wooden environmental characteristics that are unmatched by any other materials. It is good for one's health, improving living quality and working efficiency. The paper also described the specific properties of wood in visual sense, sense of touch, sense of hearing, sense of smell, and regulation, and as well as the relations between wood, human being and environment.

Key words: Furniture, Environment, Wooden environment characteristics

(Responsible Editor: Chai Ruihai)